REMARKS

Claims 1 to 11 are pending in the application.

Rejection under 35 U.S.C. 102

Claims 1-11 stand rejected under 35 U.S.C. 102(b) as being anticipated by *Arikawa (US 4,854,649)*.

Claim 1 has been rewritten in order to define the device more clearly by associating the function set forth in the preambe of the claim 1 as originally filed with the respective elements of the device.

The examiner states that *Arikawa* discloses a solenoid valve (element 60 in Fig. 1) for controlling flow of a pressure medium; a camshaft adjuster (element 30 in Fig. 2) with a rotary slide valve (element 32 in Fig. 2) that is configured to be fixed to a camshaft and has at least one piston (32) to be acted on by a pressure medium at both ends (40, 42 of Fig. 2).

While applicant agrees that a solenoid is disclosed in this reference, applicant disagrees entirely with the remaining assumptions of the examiner.

Firstly, the cited reference nowhere shows a camshaft adjuster; the cited reference discloses an anti-skid control for a braking system. The element 30 of Fig. 2 identified by the examiner as the camshaft adjuster is simply the casing of the valve 12 (see col. 4, lines 49-51).

The camshaft adjuster is **positively claimed** in instant claim 1. A camshaft adjuster is a device for adjusting a camshaft in a motor vehicle engine for proper timing etc. The term is used in the patent literature by all major car makers: General Motors Corporation; DaimlerChrysler AG; Volkswagen AG (see attached cover pages of US 5,197,420; US 6,363,896; US 6,675,752). The Porsche website "Engine and Transmission" (copy attached) also uses the term camshaft adjuster (see position 2 of Legend 1). It is a term of the art, and it is made clear in the instant application that precisely such a device is meant.

Moreover, instant claim 1 defines that the camshaft adjuster has a rotary slide valve. A rotary slide valve by definition (see attached copy of "The Piping Tool Box - Classification of Valves") is a valve in which a rotation of internal parts regulates flow by opening or

closing ports. Therefore, the valve operates by a rotary action and not by a sliding action in the axial direction. The "rotary slide valve" 32 of Fig. 2 identified by the examiner is a piston that moves axially between right and left end positions; there is no rotary action whatsoever. The operation of the valve 12 with piston 32 is described in col. 4, line 49, to col. 5, line 23, of the cited reference.

A camshaft adjuster acts on the camshaft by rotating it into a proper position. The valve 12 can only control the supply of pressure medium to other devices in response to control signals of the control unit; it is unable to perform a rotation of a camshaft absent additional means that act on the camshaft.

Aside from the camshaft adjuster configurations of the three patents mentioned above, the basic operation of a camshaft adjuster with rotary slide valve can be take also from the following patents: US 6,390,043; US 6,209,497; US 6,129,063; and US 6,053, 138 (copies of the front pages attached). Two of these patents are partially owned by the assignee of the instant application.

The instant specification also provides detailed information regarding the function of the camshaft adjuster 32 (illustrated in Figs. 10 through 12). The camshaft adjuster 32 of the present invention is fixedly connected to the camshaft 31 for rotating the camshaft. The camshaft adjuster 32 comprises a rotary slide valve 54 that is fixedly secured on the camshaft 31 and is rotatable within a cylindrical housing 55. The housing 55 has radially inwardly projecting stays 56 to 60 distributed uniformly about the inner periphery and provided with end faces 61 to 65 resting areally against the cylindrical outer mantle 66 of the rotary slide valve 54. The rotary slide valve 54 has arms 67 to 71 projecting into the space between the stays 56 to 60. Their curved end faces 72 to 76 rests areally against the cylindrical inner wall 77 of the housing 55. The housing 55 has two parallel positioned annular lids 78, 79 (Fig. 10) between which the rotary slide valve 54 is positioned.

In the area of the camshaft end 82 the rotary slide valve 54 has a central axial bore 83. Radially extending bores 84 (Fig. 11) penetrate the rotary slide valve 54 and connect the central bore 83 with pressure chambers 85 between the stays 56 to 60 and the neighboring arms 67 to 71. Fig. 11 shows the rotary slide valve 54 in one stop position in which its arms 67 to 71 rests against the left sidewalls (as seen in Fig. 11) of the stays 56

to 60.

The axial bore 83 is connected by a transverse bore 88 with an annular groove 89 which is provided in the outer mantle of the camshaft end 82 and is delimited by a ring 90 in the radially outward direction. A bore 91 opens into the annular groove 89; via the bore 91 the hydraulic medium is supplied from the tank 9 or storage 7.

The camshaft end 82 is provided at its outer mantle surface with a further annular groove 92 (Fig. 10) which is closed off by a ring 90 radially outwardly and into which a bore 93 opens. An axial bore 94 is connected to the annular groove 92 and opens into an annular groove 95 in the camshaft end 82. Bores 96 radially penetrate the rotary slide valve 54 and connect the annular groove 95 and the pressure chambers 97 provided between the stays 56 to 60 of the housing 55 and the arms 67 to 71 of the rotary slide valve 54. The pressure chambers 85 and 97 are separated from one another by arms 67 to 71 of the rotary slide valve 54.

In the position illustrated in Figs. 10 through 12, the hydraulic medium is guided via the bores 96 under pressure into the pressure chambers 97 so that the arms 67 to 71 are moved against the projections 86 of the stays 56 to 60. This position is the start position of the camshaft 31. By switching the solenoid valve, hydraulic medium is guided via the annular groove 89, the transverse bore 88, the axial bore 83, and the radial bore 84 into the pressure chambers 85, and the rotary slide valve 54 is rotated clockwise in Figs. 11 and 12 relative to the housing 55 toward the oppositely positioned stays or projections 87. Since the rotary slide valve 54 is fixedly connected to the camshaft 31 so as to effect common rotation, the camshaft 31 is rotated also. The hydraulic medium present in the pressure chambers 97 is displaced via the radial bores 96, the annular groove 95, the axial bore 94, the annular groove 92, and the bore 93 back to the tank 9 or storage 7.

In this way, by supplying hydraulic medium to the chambers 85 or chambers 97, the rotary slide valve is moved clockwise or counterclockwise, and the camshaft attached thereto is entrained for adjusting the camshaft position. The arms 67-71 of the rotary slide valve act as pistons that are loaded by the pressure medium on the end facing the pressure chamber 85 or the pressure chamber 97, respectively; they are moved in this way clockwise or counterclockwise into the end position against the stays 56 to 60, respectively.

The term piston is used in claim 1 so as to indicate a sliding part that is moved by fluid pressure. According to *Merriam-Webster OnLine*, this is an accepted general definition of a piston, even though commonly a piston is understood as a cylindrical part.

The valve apparatus 12 (casing 30; piston 32) of the prior art, no matter how it is connected to the camshaft, is unable to cause in any way a rotation of the camshaft and thus an adjustment of the camshaft. It is not disclosed as a camshaft adjuster and it cannot function as a camshaft adjuster; also, it does not have a rotary slide valve.

Claim 1 is therefore neither anticipated by nor obvious in view of the cited reference and should be allowable together with its dependent claims.

CONCLUSION

In view of the foregoing, it is submitted that this application is now in condition for allowance and such allowance is respectfully solicited.

Should the Examiner have any further objections or suggestions, the undersigned would appreciate a phone call or **e-mail** from the examiner to discuss appropriate amendments to place the application into condition for allowance.

Authorization is herewith given to charge any fees or any shortages in any fees required during prosecution of this application and not paid by other means to Patent and Trademark Office deposit account 50-1199.

Respectfully submitted on March 18, 2005,

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GEH
Encl.: time extension petition (1 sheet) and PTO-2038 (1 sheet)
copies front page of US5,197,420; US6,363,896; US6,675,752 (3 pages)
copy "Engine and Transmission" - Porsche.com (1 page)
copies front page of US6,390,043; US6,209,497; US6,129,063; US6,053,138 (4 pages)
copy of "The Piping Tool Box" - Classifications of Valves (2 pages)
copy of *Merriam-Webster OnLine* - piston (1 page)